

ABSTRACT OF THE DISCLOSURE

Ions are implanted into a substrate, using a gate and its sidewall liner on the substrate as the mask, to form a source/drain region in the substrate beneath the liner and adjacent to the two sides of the gate. The liner is etched to
5 reduce its thickness. Then, ions are implanted into the substrate to form a halo doped region surrounding the source/drain region. The halo doped region is closer to the MOSFET channel region and overlaps less with the source/drain region. Therefore, the device threshold voltage can be sustained and the junction leakage can also be minimized.